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13. ABSTRACT *(Maximum 200 words)*

The purpose of this multisite investigation is to attempt to quantify risk or establish baseline rates for the offspring of female soldiers by career management field or military occupational specialty for the following outcomes: spontaneous abortions, ectopic pregnancies, intrauterine fetal demise, preterm birth (PB), low birth weight (LBW), preterm and low birth weight infant, and congenital abnormalities. Currently, 3779 subjects have been enrolled, which consist of 1026 soldiers, 164 daughters of soldiers or military retirees, 2572 spouses of active duty soldiers or retirees, and 20 women classified as other. A total of 1694 outcomes have been obtained of which 1502 were births. Preliminary analysis revealed that significant risk factors for LBW were previous LBW delivery Relative Risk (RR) 3.27(1.54,6.90) and black race RR 2.10(1.45,3.05). Black race has been associated with a 218 gm statistically significant lower mean birth weight (3070 gm vs. 3288 gm, p=0.000004). Significant risk factors identified for PB were a history of previous PB RR 3.45(1.92,6.18) and black race RR 1.71(1.16,2.52). Soldiers do not appear to be at risk for LBW RR 1.32(0.90,1.94) or PB RR 1.21(0.82,1.79) at this time.

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FOREWORD

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PI - Signature 20 Aug 95 Date

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1. **Introduction and Background:** As of June 1991 there were approximately 82,000 female soldiers serving on active duty in the United States Army, and demographically can be characterized as a population which is young (approximately 17-45) and reproductively active. The Army offers these women career opportunities that are varied and diverse in the majority of the Army military occupational specialties(MOS). No investigations have been conducted regarding the risk of adverse pregnancy outcomes to soldiers by MOS. The risk of Adverse reproductive outcomes occurring in the offspring of female soldiers is unknown. This study has been designed to follow a cohort of soldiers and nonsoldiers prospectively over time to elucidate what the risk of adverse pregnancy outcomes to the offspring of female soldiers may be. Multiple epidemiologic investigations of occupation or employment regarding adverse reproductive outcomes have been undertaken. The results of these investigations have been contradictory with some investigators finding no association between occupation or employment and adverse reproductive outcomes,[1-13] while other investigators found positive associations between these variables.[14-33] Fox et al[34] conducted a study from 1974-1976 involving active duty Air Force personnel; this study's conclusions led its investigators to surmise that the pregnancy during active duty represented a high risk pregnancy. Weaknesses in this investigation are primarily due to a small sample size (n=195 pregnancies), and a dramatically changed role and composition of women both in the Army and Air Force in 1991 verses 1976. Birdsong[35] reported in 1987 an excess

rate of ectopic pregnancies found in enlisted soldiers and airmen, his investigation was conducted upon service members assigned in West Germany, the crude rates were 1/27 and 1/32 respectively. Other studies have focused on the health status and reproductive outcomes of Vietnam Veterans[36-39] and found, in general, no association between service in Vietnam and increased adverse fetal outcomes. Baker reported in 1989, upon an investigation conducted regarding health experiences of U.S. military nurses who served in Vietnam,[40] this author noted an increased number of health problems of female nurses and their children which were related to Post Traumatic Stress Syndrome. More recently, Ramirez et al[41] reported in 1990 on a retrospective study conducted upon U.S. Army primigravidas in relation to occupational activity and preterm birth. This investigation noted an increased risk of preterm delivery related to age, pay grade, and physical activity, with an odds ratio(OR) of 1.69(1.08,2.64) for heavy physically demanding tasks and an OR of 1.75(1.12,2.75) for very heavy physically demanding tasks. However, confounder data was unavailable for cigarette smoking, alcohol consumption, and pregnancy complications, which render these results interpretable with caution.

2. **Objectives:** The purpose of this current investigation is to attempt to quantify risk or establish baseline rates for the offspring of female soldiers by CMF or MOS for the following outcomes: spontaneous abortions, ectopic pregnancies, intrauterine fetal demise, preterm birth, low birth weight

infant, preterm and low birth weight infant, and congenital abnormalities.

3. Data Quality Control

This will be accomplished by having different individuals enter the data into two separate record files and utilizing the Validate program in Epi Info. This program will cross check the data entered into both files and then list discrepancies between the files.

4. Results:

a: Respondents by site:

	Pilot	Ft. Carson	Ft. Lewis	Ft. Bragg	Ft. Riley	Ft. Campbell	Totals
Active Duty	594	45	99	177	49	62	1026
AD Daughters	43	5	6	5	3	2	64
Retiree Daughters	61	11	12	10	2	1	97
Other	9	1	8	2	0	0	20
AD Spouses	1444	209	306	240	143	190	2532
Retiree Spouses	27	1	9	1	3	0	40
Totals	2178	272	440	434	200	255	3779

b. Pilot Project: A total of 1694 outcomes have been obtained from the pilot project at Ft. Carson, of which 1502 were births. An 81.48 gm ($p=0.039$) lower mean birth weight has been noted in the soldier population when the cohort was dichotomously classified by soldier status, however this relationship became nonsignificant after stratification by race ($p=0.305$). Black race when compared to the non black cohort has been associated with 218 gm statistically significant lower mean birth weight(3070 gm vs. 3288 gm, $p=0.000004$).

Relative Risk (RR) estimates:

	RR	CI 95%
Previous LBW vs Current LBW Delivery	3.27	1.54,6.90
LBW vs Soldier Status	1.32	0.90,1.94
LBW vs Black Race	2.10	1.45,3.05
Previous Preterm vs Current Preterm	3.45	1.92,6.18
Preterm Birth vs Soldier Status	1.21	0.82,1.79
Preterm Birth vs Black Race	1.71	1.16.2.52

A cross sectional study has been performed on the pooled soldier data from all of the sites. This study has revealed that the overall unplanned pregnancy rate for the active duty soldiers enrolled was 46.5%, however, the unplanned pregnancy rate for female soldiers residing in the barracks was 76.1%. The odds ratio for pregnant female soldiers who live in the barracks for unplanned pregnancy was 4.10(2.90,5.81) and the odds ratio for pregnant female soldiers never having taken oral contraceptives was 2.89 (1.97,4.25). This early data has helped to identify the active duty soldier population as a risk group to target for pregnancy prevention. The unplanned pregnancy rate is felt to substantially impact upon readiness, man-hours lost to the soldiers' unit, and dollar cost for medical care.

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